

A Brief Report of a Study

about

Sighting the Moon or Calculation

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All Muslims agree that we have to fast during the month of Ramadan, but Muslim scholars differ on how to decide the beginning of the month and the end and which means to use. The following is a brief report of a study for a sample of current opinions among Muslim scholars majoring in Islamic studies and Astronomy.

The following are the main questions of the study:

1. What are the main opinions concerning sighting and calculation.
2. What are their evidence? And what is the validity of their evidence?
3. What are the conclusions and the recommendations?

Basics of Research Methodology:

The researcher followed these steps and principles:

First. Collecting a sample of the writings in Arabic and in English for about fifty scholars majoring in Islamic studies or in Astronomy. The sample basically contained articles, responses to questions and counter arguments.

Second. Following the methodology of inferring teachings from the Holy Quraan and the Sunnah such as:

1. Choosing closely related evidence from the Holy Quraan, Prophetic traditions and astronomical sources.
2. Avoiding mistakes such as: looking for the meaning of “*Ahillah*” (plural form of *hilaal*) under *مواقيت* *mawaqeet* (marks), or under *منازل* *manaazil* (phases).
3. Choosing the most clear cut texts, which are not subject to misinterpretation, as much as possible, and to verify the exact meaning or meanings, avoiding addition to the text, deletion or exaggeration.
4. Choosing the most authentic Prophetic traditions, such as the ones reported in Saheeh al-Bukhari or Saheeh Muslim... In other words, repetition of a Hadeeth does not mean it is necessarily authentic. Usually a

Hadeeth with the same content and the same chain of narrators appears numerous times across different compilations, or with some difference in the chain of the narrators of the Hadeeth; or repeated with a minor change in the text itself (addition, elimination, rephrasing). For example the phrase “SUMOO LIROYATIHI” (صوموا لرؤيته) (If you sight it fast) appeared in 105 narrations, and the phrase “ITHA RAYTOM AL-HILAL FA SUMOO” (إذا رأيتم الهلال فصوموا) (If you sight the crescent fast) appeared in 108 narrations.

Third. To understand a verse or a prophetic tradition, the researcher implemented the following rules:

1. Reviewing the meaning/meanings of the texts in the related commentaries supported by reviewing its vocabularies in Arabic dictionaries, which usually contains many meanings for one word, and choosing the most relevant one.
2. Reviewing the various usages of the term in different contexts in the Holy Quraan and the Prophetic traditions, where applicable.
3. Verifying the context of the case carefully to establish whether the case is general or special.
4. Establishing the syntax of the term, whether it is literal, metaphorical, denotative or connotative.

Fourth. To acquire the full and accurate meaning of astronomical terms the researcher scrutinized all available definitions and usages and, purposely, depended on the ones mentioned in the sample.

Review of the Literature:

By taking a sufficient sample of the writings of the contemporary Muslim scholars: Arab and non-Arab, majoring in Astronomy or Islamic studies the research revealed three main groups: those who insist on bare eye moon sighting, those who insist that all Muslims should follow their formula of calculation and those who distinguish the means from the elements of the ritual. The last group considers the means used to determine the month of Ramadan as merely a tool which are subject to changes according to availability and development of the related tools.

The Arguments and Discussion of the First Group:

What distinguishes this group is their insistence on sighting the crescent by bare eye. Among the basic evidence of this group is that we have to adhere to the “literal” wording of the Hadeeth:

صوموا لرؤيته وافطروا لرؤيته فإن غبي عليكم فأكملوا عدة شعبان ثلاثين. أو فإن غمي عليكم الشهر فعدوا ثلاثين (البخاري ج ٢: ٦٧٤ ومسلم ج ٢: ٧٦٢)

“Fast for seeing it (the waxing crescent) and break fast for seeing it (the waning crescent). If it is cloudy complete the month of Sha’abaa 30 days.”.

What we can deduce from the Hadeeth is to fast (begin Ramadan) when we see the crescent. It confirms **that the lunar month ranges from 29 days to 30 days, giving us about 3.3% margin of error in determining the beginning of the month of Ramadan (for religious purpose), in a specific location.** This means the margin of error will increase if the number of locations increases. The Hadeeth makes sure that the tools are sensible and available to all Muslims in all circumstances. The

Prophetic tradition is an extension of the fact which came in verse (9: 36) i.e. the year is composed of twelve months.

In other words, the Will of Allah overrides the laws of nature that He created and has full control over it. Although He, the Merciful, is aware of the automatic systems that He has created, His mercy willed to allow His accounted creatures a margin of error in deciding the beginning and the end of the month of fasting as well as deciding the days of pilgrimage.

However, the text of the Prophetic tradition leaves the interpretation of “see” open; it does not say “see it by naked eye” or “only by naked eye” as some interpreters of the Hadeeth suggest. Reviewing over two hundred related Prophetic traditions repeated, either completely or partially in terms of the content or the chain of narrators, the researcher did not find any Hadeeth which says **sighting must be conducted only by using naked eye.**

Furthermore, insisting on “seeing” by bare eye, is questionable, because of the following:

1. Using the word “see” literarily it means we have to **walk** to mosques, but not driving or riding, because few Hadeeths related to performing obligatory prayers in mosques says: امشوا (walk).
2. Mixing the ritual element with the tools to realize it means we have to use stone or hard things, except bones, to clean ourselves after emptying our bowel, in case of absence of water or scarcity, and we cannot use paper towel because the related Hadeeth did not mention it.
3. limiting sighting to bare eye distorts the text of the Hadeeth, by adding to it the phrase “by naked eye.”

Using the following verse also does not support the suggested interpretation.

{ومن شهد منكم الشهر فليصمه}. (٢: ١٨٥) “Whoever **is present** in terms of time, not place or an event”, simply because the month of Ramadan is not a physical thing to be seen.

However, this group is divided into two sub groups: those who reject calculation completely, and those who are ready to create their formula of calculation in order to build their lunar calendar. Their calculation is based on the sighting by bare eyes, i.e. their formula depends on natural elements as well as conventional elements.

This group confirms that the word: *Ahillah*, in the following verse, is the plural of “*Hilal*” which means the waxing crescent moon. The Plural form is used to mach “*mawageet*” the plural form of “*meegat*” (sign/marker) which is used in the same verse. The Holy quraan reads:

{يَسْأَلُونَكَ عَنِ الْأَهْلَةِ قُلْ هِيَ مَوَاقِيتُ لِلنَّاسِ وَالْحَجِّ...} (البقرة : ١٨٩)

{They ask you concerning the “**ahillah**” crescents (new moons. Say: These are signs for the people to reckon dates and for the pilgrimage...}. (2:189)

In the light of Arabic dictionaries, this interpretation is true, because the word “**hilaal**” is derived from the root “**ahalla**” (appeared) and “**ahlan**” is another dirvitive which means “welcome”. It is the word used to great a person who was absent. So, the origin of the word and its derivations always indicates the beginning of something or the part preceding the other parts. In other words, in the context of the previous verse Hilal the single form means the beginning of the new *Qamar* (new moon)

In addition to that, recognizing the beginning of the month, is sufficient for the religious purpose. The seven days of the week with their names, take care of the

details e.g. determining the 9th day of 12th month (Thul Hijjah) which is assigned for the day of 'Arafah. What confirms this interpretation Al-Khattaabi says: Arabs used the word "Hilaal" (crescent) for "Shahr" (month).(al-khattabi 1: 130)

However, these facts raise questions about the credibility of the witness. There is always a chance for mistake, carelessness, or dishonesty; or a question of reliability as the Hijira Calendar Committee (HCC) pointed out.

Therefore, we should be careful when relying on witnesses, taking into account their commitment to moral values, diversity of interests, affiliation and number. We should be more careful in the case of a single witness, claiming sighting of the crescent, The crescent is not something that hides in caves. It is something that appears in the sky and numerous people should be able to see it, if we draw their attention to it.

To further insure reliability and efficiency, it is logical to employ technical extensions of the eye (such as telescopes) and to benefit from calculation, using formulas that do not violate the above Islamic teaching. As Salman Shaikh stated: "the relationship between sighting and calculation is complementary."

The Arguments and Discussion of the Second Group:

This group in building its formula depends on what goes on in nature and some human decisions such as: the Western scholars' convention that the **central point** of the Globe is the islands of Kiribati, in the middle of the Pacific ocean, and **the zero point of time** is Greenwich. Basically their formula says: "consider the day of Conjunction (IDL) as the last day of the month, irrespective of the time of occurrence of Conjunction or the sunset-moonset difference at Makkah or else where." (HCC)

This group tried to support their opinion by quoting these verses::

١. {إن عدة الشهور عند الله اثنا عشر شهرا في كتاب الله يوم خلق السموات والأرض منها أربعة حرم...}(٩: ٣٦)

{The number of months in the sight of Allah is twelve (in a year) so ordained by Him the day He created the heavens and the earth; of them four are sacred"(9:36)

٢. {وَالْقَمَرَ قَدَرْنَا مَنَازِلَ حَتَّىٰ عَادَ كَالْعُرْجُونِ الْقَدِيمِ، لَا الشَّمْسُ يَنْبَغِي لَهَا أَنْ تُدْرِكَ الْقَمَرَ وَلَا اللَّيْلُ سَابِقُ النَّهَارِ وَكُلٌّ فِي فَلَكٍ يَسْبَحُونَ} (٣٦: ٣٩-٤٠)

{And for the moon We have appointed mansions (phases) till she return like an old shriveled palm leaf. It is not for the sun to overtake the moon, nor does the night to overtake the day}(36: 39-40)

٣. {يسألونك عن الأهلة...}

{They ask you concerning the "**ahillah**"}, but translating "**ahillah**" to phases, instead of (crescents) the plural form of *hilaal*.

None of the previous verses support the claim of this group that only their formula represent the teachings of Allah and His Prophet.

For this group say: "Islam is complete and **perfect** certifies Almighty Allah. So, Islam too has a calendar system which has dates tallying with the moon-phases and which can also be calibrated forwards or backwards for any number of years." The question is: Is Islam for different creatures, so they cannot use a widely used calendar such as the Gregorian? And which system is more comprehensive and useful for the daily life activities: the lunar calendar or the solar calendar which helps in predicting the four seasons?

Concerning the concept of **perfection**, it varies if the system deals with humans or with machines. Human beings and the Jinn are composed of :spiritual, mental, emotional, and physical components. So, the perfect system for these creatures should include flexibility, (a room for free choice), an opportunity for a dynamic balanced interaction between the stable principles and the changing reality.

On the other hand, perfection of a system that deals with materials means nothing of the previous components, except for the physical component and it should function as $1+1 = 2$. Therefore, the concept of perfection which does not differentiates between the two categories is equal to chaos and does not make sense at all.

In general, some of the arguments of the previous groups, betray a lack in sufficient knowledge of the quoted verse or Hadeeth or a lack in sufficient knowledge of the Arabic language. For example, the word نسيئ "naseea" was misunderstood and misused.

A member of the first group says: "More over, in order to complete the minimum number of days, you have to borrow a day from the month of Rajab (رجب). Rajab being one of the sacred months, you and those who started J. Aakhir (جمادى الآخر) on Monday will be openly committing "*NASSIE (postponing)*" which is "*ziadathun fil kufi" (زيادة في الكفر) [an excess of disbelieve]* according to Quran 9:37" by postponing Rajab from Monday to Tuesday."

A member of the other group says: "For crops, Arabs used "Nasi" (Added one extra month every three years) to bring the lunar calendar back to the solar seasons. The Prophet (SAW) abolished "Nasi".

The two groups are referring to verse 9:37 and some Hadeeths related to usury. The verse reads:

{إن عدة الشهور عند الله اثنا عشر شهرا في كتاب الله يوم خلق السموات والأرض منها أربعة حرم... إنما النسيء زيادة في الكفر يضل به الذين كفروا يحلونه عاما ويحرمونه عاما ليواطئوا عدة ما حرم الله فيحرموا ما حرم الله...}{٩: ٣٦ - ٣٧}

{The number of months in the sight of Allah is twelve, so ordained by Him the day He created the heavens and the earth; of them four are sacred...postponement (of the sacred month) is only an excess of disbelieve where by those disbelievers mislead. they allow it one year and forbid it (another) year, that they may make up the number of the months which God has hallowed, so that they allow that which Allah has forbidden...}(9: 36-37)

The verse has nothing to do with postponement of a day, whether intentionally or unintentionally. It has no relation, at all, to the technique of adjustment between the lunar calendar to the solar seasons.

The verse plainly speaks about the disbelievers who know the sacredness of the four months during which fighting is forbidden. However, they choose to postpone sacredness of Muharam to the month of Safar which is not sacred every two years.

The act of Al-naseea (postponement) itself is not forbidden; it could be a good or a permissible act. For example, if you sell a person any thing and postpone the payment of the due price, without taking interest it is a praise worthy postponement. And if you postpone a day of fasting, unintentionally, your fasting is valid.

Concerning crop, the Arabs and the Middle Easterners had another solar system called "Abraaj" (Zodiac signs) plural form of 'Borj' Zodiac sign which depends on the appearance of some stars (planets). It is composed of 12 months or

units in the solar year, equivalent to the Gregorian calendar months, which predicts crop seasons.

The Arguments and Discussion of the Third group:

The status of this group is clear, flexible and practical. It gives room for an efficient interaction between the concerned principles and reality. Priority is given to availability and efficiency of the tool used to determine the month of Ramadan.

They differentiate between elements of the ritual and the means to realize it or achieve it. For example, the obligatory fast during the month of Ramadan is the element of the ritual, but the method for determining the beginning of the month falls into the means. Similarly, obligatory prayers which should be performed within certain periods of time is the element of the ritual, but the method for determining this time falls into the means. We can use sun movement during the day, an hour glass, a, or a watch. This group gives the sacred text its weight without exaggeration or addition... The Hadeeth: "Sumoo li roiatih..." gives importance to seeing the crescent, but does not limit seeing to the naked eye. This group benefits from calculation, but not at the expense of seeing. They depend on the witnesses, but not without sufficient verification suitable to the different situations.

Astronomical Facts:

Reaching the previous results about the main divisions of the available opinions, it seems necessary to review the astronomical facts.

Reviewing the Astronomical facts and related information, of which some were mentioned in the sample, we reach to these facts:

First. Our dates and time are products of the relationship between –at a close look- the sun the earth and the moon, which are moving constantly systematically as The Creator of the universe has designed it.

Second. The earth is not flat but a globe which moves around the sun, and around which the moon circles. So, "the moon is not seen everywhere in the same evening." "Keep in mind that there are always 4-5 parallel "Local" Hijri calendar dates for each solar date because the "Local" visibility covers the entire globe on multiple solar dates" i.e. multiplicity of moon appearance points (Moon Sighting News; Salman Skaikh, North American Observation Committee)

Third. In reality there is no such thing as one sunrise (East) or one sunset (West) on the Globe, but there are multiple... The Holy Quraan confirms this fact, whether across planets or in a single planet {Lord of the sun's risings and sunsettings (70: 40) and {Lord of the two sunrise and two sunsets} (55: 17) and Lord of sunrise and sunset, at a specific location (26: 28; 73: 9). The east and the west are relative things, what is west of you might be east of me. The standardized or the International East and West are terms that the dominant culture (the Western) has imposed, and it is a man made term i.e. artificial.

Fourth. Allah provided his creatures especially the accounted creatures (Humans and Jinn) with basic accessible tools to determine dates and time such as: 1) **the day** with its daytime and night 2) **the week** with its named seven days, 3) **the lunar month** with its 29-30 days 4) and **the year** with its 12 months. These basic units of time and dates can be divided into smaller parts and made more sophisticated (hours, minutes,...), and can be adjusted to make it easier to use (inventing calendars, IDL, Greenwich time, Longitudes and Latitudes...)

Fifth. All formulas of date calculation are based on a mixture of what goes on in nature (relation between sun, Earth and moon) and man made components.

The human contribution to any formula of calculation appears when determining the following: (Afzal; Manikfan; Uthman; al-Musnad...)

1. A fixed point on earth to start the lunar month (Dateline);
2. A fixed point in a day/night from which to start the day/date
3. A fixed duration of the lunar month.

No wonder “each expert has his own ideas”(Afzal). So, there is possibility for countless “Islamic ” formulas to calculate an “Islamic International calendar.” For example, one formula considers IDL (at Kiribati) as the central point (location) and noon (according to Greenwich mean time). Another formula depends on “A naked-eye sighted waxing crescent moon **at 180E on the given solar date**”... A third formula considers Makkah the central point and the possibility of sighting the crescent after sunset, for example, at least for 6 minutes.

Sixth. A standardized calendar, no matter what we do, will **violate** what goes in nature and violate the critical Islamic provision i.e. actually sighting the crescent (even by using the technical extensions of the eye), or the possibility of sighting it at a specific location or locations. The Earth is not flat, which means the crescent which could be seen in one location by naked eye can only be seen by telescope in another area, and cannot be seen at all in other areas (Salman Shaikh).

Seventh. The violation passes the Islamic range of error (24 hours) in some areas, because the “Hilal (crescent) may not be “locally” seen at the local sunset everywhere and may be delayed 24-72 hours in extreme northern and southern regions, depending on where the initial visibility for that month began”.(Afzal) It is true that the extreme northern and southern regions are considered exceptional cases, but the margin of the error should not exceed 24 hours in, at least, two thirds of the Globe. Acknowledging sighting by telescope and the theory of possibility of sighting will minimize the number of مطالع the central locations of sighting the crescent.

Finally let me recall some main questions designed to help sorting out the existing opinions and to “check point” the evidences of the extreme opinions, which were received by: anger, avoidance, or rare direct answers. The essential questions which were formed, after reading hundreds of pages in Arabic and in English on the topic, are:

1. Is there any verse or Hadeeth which plainly states that we should **only** fast when we see new moon by the naked eye?
2. Is there any verse or Hadeeth which plainly states that we should fast using **only one specific** formula of calculation?
3. The complete disappearance of the moon occurs **only in one area on Earth** i.e. isles of Kiribati, in the middle of the Pacific ocean?

The answers in the light of the previous discussions are: NO.

In the light of the above facts, we can conclude that we cannot force Muslims to fast and celebrate the two Eids or perform pilgrimage according to any international lunar calendar, no matter what we call it: Islamic calendar, Hijri... And if we have to make more than one lunar calendar the benefit would be minor, because it does not facilitate the daily dealings even among Muslims. Therefore, if it is permissible to borrow the inventions and products of our non-Muslim brothers and sisters, as long as they do not violate Islamic teachings, we can borrow the Gregorian calendar and the Greenwich mean time for worldly activities. But for our religious activities we are independent and it is for Allah and His messenger to decide, being sure that Allah has His wisdom which sometimes we cannot grasp, but it is always

there. In other words, the means of deciding the right date to begin fasting or ending it is not a pure astronomical matter and the will of God cannot be subjected to human knowledge.

Conclusions of the Discussion:

1. The solar system is more comprehensive and more useful and more helpful in building a stable or predictable system. Allah, the Wiser, Has chosen it as a system to help farmers and travelers and to recognize times of prayers. However, Allah, the most merciful, Has chosen the Lunar system to assign the month of fasting and time of pilgrimage, because it is more merciful than the solar system for this purpose. It is more merciful because the month of Ramadan will not come always in summer or in winter i.e. not constantly in a specific wither for those who live in the northern part of the Globe or the southern part. This choice reflects the mercy of The Creator in terms of the degree of the heat especially during the day time, and the length of daily fasting.
2. Multiplicity or variability is more merciful than forced unity based on an imaginary theory, because artificial unity or standardization in this case goes against nature, whether it is human nature or the laws of nature.
3. Assigning a range of time for the accepted worship is more merciful than a fixed time. Perhaps, this is why Allah, the most Merciful, granted His servants a span of time for the accepted prayers (from - to) and granted a margin of error (about 3.3%) in determining the month of Ramadan, in a specific location. and the time for pilgrimage.
4. Allah made **the movement of the sun**, at specific geographical location, to help decide the times of the daily prayers because it is easy for any natural creature, not only an astronomer, to use it to perform his prayers and schedule his activities. On the other hand, Allah has chosen the beginning and the end of the moon movement at a certain location (the lunar system) to determine the month of fasting or the time of pilgrimage. This is because any natural human being or jinn, without the help of an astronomer, can use it to begin his fasting...and to prepare himself for pilgrimage.

Therefore, Muslim astronomers can divide the Globe into fixed locations or regions depending on the complete conjunction points to secure the areas where the same crescent can be seen by bare eye, telescopes or at least guarantee the possibility of sighting it. This kind of division helps creation of local calendars which are reliable in determining the dates required for religious purposes. But it does not help in the daily dealings with the others, even among Muslims only.

As many concerned scholars are aware Islam does not forbid benefiting from the tools or the means invented by non-Muslims, the real criterions are: availability, easiness and proficiency. In fact, Muslims are already soaked in their information, systems...material products. If any lunar or solar calendar assists better our daily activities and international dealings, we can use it for worldly affairs. But for religious purposes we should have an independent calendar, based on the basic teachings of Islam. If we can adjust “non-Islamic” religious calendars to the “Islamic religious” calendar it is ok, but not vise versa.

As it was mentioned before, the Islamic religious calendar is composed of elements accessible, to all accounted creatures(Humans and Jinn), in all circumstances. The elements are: the day, the week, the month, and the year, with a margin of error in determining the month equal to 24 hours in the normal

situations. It covers –at least- two thirds of the space on the Globe, after subtracting the areas around the northern or the southern poles.

Concerning the critical day of pilgrimage, which is the day of ‘Arafah, there is no substitute for the calendar, which is valid in Makkah region, because there is only one mount ‘Arafa on Earth that is the one near Makkah al-Mukkaramah.

Hijira Calendar Committee confirms that “determining the visibility of the crescent is not as definitive or conclusive as it should be; rather it is dependent upon several factors, including the available recordings around the world.” Therefore, the researcher would recommend that Muslim scholars of Astronomy direct their studies to improve the available Astronomical theories which are related to moon, instead of spending their efforts on Islamizing the existing theories and available information.

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29 Ramadan 1433H
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8/17/2012